

Amphibians respond behaviorally to impact of clear cutting

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The Ringed Salamander (*Ambystoma annulatum*) is a species unique to the Ozarks. Credit: Photo by Bill Peterman

The number of amphibians drastically decreases in forest areas that are clearcut, according to previous studies. A University of Missouri researcher, however, has found that some animals may not be dying. Instead, the Mizzou biologist said some animals may be moving away (possibly to return later) or retreating underground. The finding could have major implications for both the timber industry and the survival of amphibians.

“Everyone jumped to the conclusion that the frogs and salamanders were dying after a clearcut had occurred,” said Ray Semlitsch, professor of biological sciences in the MU College of Arts and Science. “Anecdotal

data accumulated through the years indicated there were potentially three things amphibians could do: stay and die, retreat underground or evacuate the site. We have never been sure of how they respond to strong habitat changes, especially behaviorally.”

Semlitsch and his graduate students at MU found, during a period of two years, that significantly more salamanders and frogs evacuated clearcut treatments than entered, although the researchers cannot say what portion also may have died or retreated underground. Documenting this evacuation response is important because animals are potentially available later for re-colonization once the forest begins to grow back.

The results of the study present two primary implications for timber management that would benefit amphibians. First, timber harvesters producing clear cuts that are small (within a six-acre area) may improve the chances of amphibians being able to move out of the area until sufficient reforestation occurs. Second, if harvesters leave coarse woody debris (everything over two inches in diameter) on the ground, it will contribute to the amphibians’ survival by creating food, maintaining moisture and providing shelter.

Semlitsch said amphibians are potential bio-indicators of ecosystem health and are the most threatened vertebrate type globally, with one-third, or 1,896 species, currently at risk of extinction. Studies done in the past indicate harvesting forest is particularly detrimental. Amphibians are very sensitive to water loss, heat and changes in temperature. They have no natural barrier to water loss. Semlitsch found that amphibians may be able to react to changes in their environment in an effort to alleviate risk in ways previously undocumented.

Semlitsch said one of his goals is trying to maintain ecosystem health and function and developing principles to help species persist.

“I am trying to develop general principles to help us manage our natural resources without exploiting them to a point where ecosystems begin to fall apart,” he said. “I am not against cutting trees, but let’s do it in a way that’s responsible and will maintain forests and the timber industry, as well as amphibians, for generations to come.”

Source: University of Missouri-Columbia

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